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| EXAMINER | |
|---|---|
| EINSMANN, JULIET CAROLINE | |
| ART UNIT | PAPER NUMBER |
| 1634 | 12 |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/803,736 | BUSH ET AL. | |
| | Examiner | Art Unit | |
| | Juliet C Einsmann | 1634 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 November 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *18-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-29* is/are rejected.

7)☒ Claim(s) *20-23,25 and 26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election with traverse of polymorphisms 466799 and 471736 in Paper No. 11 is acknowledged. At the time the restriction requirement was set forth, there were two independet claims pending, claims 18 and 19. The restriction requirement was set forth because the claim 18 requires "polymorphisms selected from the group consisting of Single Nucleotide Polymorphisms 466799, 471736, ..." and the list continues to include 100 different polymorphisms. In a similar fashion, claim 19 recites "wherein the collection of non-identical nucleic acid molecules is capable of detecting polymorphisms selected from the group consisting of Single Nucleotide Polymorphisms 466799, 471736..." and the list continues to include 25 different polymorphisms. Thus, in light of the fact that the claims require only two polymorphisms selected from a long list, and in light of the fact that each polymorphism itself is an independent and distinct invention which is not structurally related to the others, applicant was required to select two polymorphisms from the recited list for prosecution. Applicant traverses the requirement on the grounds that "it is an improper attempt by the PTO to rewrite claim 18 to cover another invention...and thus is effectively an improper rejection of claim under 35 U.S.C. 121," further stating that this type of effective rejection for a Markush claim is improper as a matter of law, citing In re Weber. However, the examiner has not rejected the claims, as was done in In re Weber, but has required a restriction among independent and distinct inventions. In Weber, a generic claim was set forth, and the examiner rejected the claim under 121 and did not further consider the claim on its merits, nor did the examiner provide the opportunity for an election of species. Claims 18 and 19 are not generic claims. Instead, they

recite a number of independent and distinct inventions. The do not require the presence of all of the listed polymorphisms, but instead, requires only that the "polymorphisms" be selected from within the elected groups. A portion of MPEP 803.04 are repeated herein for Applicant's convenience.

> "Examples of typical nucleotide sequence claims include ...C) a combination of DNA fragments, said combination containing at least thirty different DNA fragments selected from SEQ ID Nos. 1-1,000...Applications containing only composition claims reciting different combinations of individual nucleotide sequences, such as set forth in example (C), will be subject to a restriction requirement. Applicants will be required to select one combination for examination."

In the instant case, the "combination" claim requires only that "polymorphisms" be present, thus at a minimum two polymorphisms. The requirement set forth by the examiner is a restriction requirement which applicant may petition, but is not subject to a possible appeal. Applicant further traversed the restriction requirement on the grounds that the examiners suggestion that it would be a burden to search all of the possible combinations set forth in the claims is a "pitiful excuse for denying examination of Applicant's invention." However, this is not persuasive. The examination of a single nucleotide polymorphism and claims drawn thereto involves more searching than simply looking at a table ranked by percent identity of a sequence search, and in fact, often disclosure of single nucleotide polymorphisms cannot be identified by a sequence search because SNPs are often reported in tables and figures as opposed to by sequence submissions to major sequence databases. Furthermore, instant claim 18 encompasses 4,950 sets of two polymorphisms within the one hundred SNPs recited. Claim 19 encompasses 300 sets of two within the twenty five recited polymorphisms. The volume of searching required to address these claims in their entirety, even with the use of computer sequence searches is very large and would be a substantial burden on the examiner. In light of the fact that each of the

polymorphisms referred to in the instant claims is structurally distinct, requiring a separate search of the literature and in light of the fact that the search of each polymorphism individually or in pairs is not coextensive for each pair, the traversal is not persuasive.

The requirement is still deemed proper and is therefore made FINAL.

2. It is noted that the amendment filed in paper number 9 introduced generic claims which do not particularly recite any polymorphisms. These claims will be examined commensurate with their full scope. The claims which recite particular polymorphisms will be examined in accordance with the elected invention.

3. It is further noted that in response to the restriction requirement Applicant elected polymorphisms of SEQ ID NO: 466799 and 471736. However, the sequence listing only provides 1,582 sequences. In a telephone conversation with Thomas Kelley on January 15, 2003 it was confirmed that the numbers referred to by "SEQ ID NO" in the response to the restriction are in fact "MarkerNames" as provided in Table A of the specification. Thus, they will be treated as such throughout prosecution, and the reference to them as SEQ ID NO's in paper number 11 will be disregarded.

***Specification***

4. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

***Priority***

5. An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an

application data sheet (37 CFR 1.78(a)(2) and (a)(5)). In the instant application the specification recites a claim to priority to a particular case by filing date and attorney docket number but not by US application serial number. Correction to recite the US application serial number is required.

### *Claim Objections*

6. Claim 20 is objected to because it recites "molecules is deposited on a substrate" and there is not subject verb agreement between the plural "molecules" and the singular "is." Correction is required.

7. Claims 21, 22 and 23 are objected to because they refer to "Table A." Applicant is reminded that MPEP 2173(s) states:

> "Where possible, claims are to be complete in themselves. Incorporation by reference to a specific figure or table is permitted only in exceptional circumstances where there is no practical way to define the invention in words and where it is more concise to incorporate by reference than duplicating a drawing or table into the claim. Incorporation by reference is a necessity doctrine, not for applicant's convenience."

Applicant should amend the claims so that they are complete in themselves by referring to appropriate sequence identifiers.

8. Claims 25 and 26 are objected to because they recite "said set...include" which is not proper subject verb agreement between the singular "set" and the plural "include."

### *Claim Rejections - 35 USC § 112*

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 18-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18, 24, 25, and 26 is indefinite over the language "having recorded thereon polymorphisms" or "having recorded thereon a set of polymorphisms" because it is not clear what it means to have a polymorphism recorded onto a computer readable medium. The specification defines a polymorphism as a variation or difference in the sequence of a genetic region that arises in some of the members of a species (see page 8). The specification further defines "recorded" as referring to a process for storing information on a computer (see page 49). Thus, it is not clear how a polymorphism, which is a genetic variation or difference, is recorded on a computer readable medium.

Claims 18-23, 25-26, and 28-29 are indefinite because it is not clear what constitutes single nucleotide polymorphism 466799 or single nucleotide polymorphism 471736. The specification contains Table A which provides some identifying characteristics of the polymorphisms, but neither the table nor the claims define what are the necessary features of the polymorphisms. For example, it is not clear what sequence must be present in order for the polymorphism to be present.

Claims 19-23 and 27-29 are indefinite over the recitation "capable of detecting" because capability is a latent characteristic and the claims do not set forth the criteria by which to determine capability. That is, it is not clear whether the recited collection of non-identical nucleic acids have the potential to detect or do in fact detect the polymorphisms in the Arabidopsis thaliana mapping population. Furthermore, even if the claims recited wherein the

non-identical nucleic acids detect the polymorphisms, this would still be indefinite because it is not clear how a collection of nucleic acids would actually detect a polymorphism. There is no structure provided for the claimed nucleic acid molecules that indicates what is essential for the nucleic acids to detect the polymorphisms. Nucleic acids are chemical structures that hybridize, for example, to other nucleic acids, but it is not clear physical, structural characteristics would have to be present for a nucleic acid to be able to detect a polymorphism. Moreover, when a polymorphism is "detected" does that mean that the nucleotide base present at a particular site is determined, or that one is determining that within a population there exists variation? Clarification of the claims is required.

The phrase "the locus" in line 7 of claim 21 lacks proper antecedent basis because the claims do not previously refer to a locus.

In claim 21, the phrase "said polymorphism" in line 7 lacks proper antecedent basis in the claim because neither claim 21 nor claim 19 from which it depends recites a polymorphism. Claim 19 recites "polymorphisms," but it is not clear from the language of claim 21 which one of these polymorphisms is being referred to in claim 21.

Claims 21, 22 and 23, are all indefinite over the recitation "in the BAC which is defined in Table A" because Table A does not appear to clearly identify a "BAC." Table A has a series of column headings, one of which is "BAC name," but this appears to be an arbitrary identifier of a BAC, and thus, it is not clear what is required for the segment to be located in the particular BAC. Referring to the BAC by proper SEQ ID NO would be helpful in this regard.

The phrase "said polymorphic sequence" in line 8 of claim 21 lacks proper antecedent basis because the claim does not previously refer to a polymorphic sequence. Each of these

phrases (said polymorphism, the locus, and said polymorphic sequence) are repeated in part (b) of claim 21 and these lack antecedent basis for the same reasons.

The phrase "said sequence identity" in claim 22 lacks proper antecedent basis because the claim does not previously recite the phrase "sequence identity."

Claim 23 is indefinite over the recitation "comprising at least one polymorphism" because it is not clear if this phrase is modifying the previously recited pair of isolated nucleic acid molecules or if this phrase is modifying the previously recited segment of Arabidopsis thaliana DNA.

The phrase "the locus" in line 8 of claim 23 lacks proper antecedent basis because the claims do not previously refer to a locus.

In claim 23, the phrase "said polymorphism" in line 8 lacks proper antecedent basis in the claim because it is not clear what polymorphism is being referred to in the recitation of "said polymorphism. Claim 23 recites a polymorphism in line 4, claim 21 from which claim 23 depends recites a polymorphism (which does not have proper antecedent basis), and claim 19 from which they both depend recites multiple polymorphisms. It is not clear which polymorphism is being referred to in line 8 of claim 23.

The phrase "said polymorphic sequence" in line 9 of claim 23 lacks proper antecedent basis because the claim does not previously refer to a polymorphic sequence. Each of these phrases (said polymorphism, the locus, and said polymorphic sequence) are repeated in part (b) of claim 21 and these lack antecedent basis for the same reasons.

The phrase "the other of said molecules" in line 10 of claim 23 is unclear because the claim previously refers to a set of non-identical nucleic acid molecules and a pair of isolated

nucleic acid molecules. Amendment of the claims to recite "the other of said pair of isolated nucleic acid molecules" would overcome this issue.

Claims 28 and 29 are indefinite over the recitation "non-identical nucleic acid molecules to capable of detecting" because this language is nonsensical and thus it is not clear what applicant intends. Particularly it is not clear what it means "molecules to capable of detecting."

***Claim Rejections - 35 USC § 101***

11. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 18, 24, 25, and 26 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. MPEP 2106(IV)(B)(1) states,

> "'Nonfunctional descriptive material' includes but is not limited to music, literary works and a compilation or mere arrangement of data....When nonfunctional descriptive material is recorded on some computer-readable medium, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material stored in a computer-readable medium does not make it statutory. Such a result would exalt form over substance."

Thus, since the instant claims are drawn to an arrangement of data on a computer readable medium, they are rejected as being directed towards non-statutory subject matter.

12. Claims 18-29 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility.

Claims 18, 24, 25, and 26 are drawn to computer readable media that have polymorphisms recorded thereon. Claim 18 is drawn to a computer readable medium that has recorded thereon the two polymorphisms identified as 466799 and 471736. Claim 24 is drawn to a computer readable medium that has recorded thereon a set of polymorphisms distributed

throughout the genome of Arabidopsis, and claims 25 and 26 specify that the set comprise particular polymorphisms.

Claims 19-23 and 27-29 are drawn to collections of non-identical nucleic acids capable of detecting polymorphisms distributed throughout the genome of Arabidopsis. Claim 19 is drawn to a collection of non-identical nucleic acid molecules capable of detecting the two polymorphisms identified as 466799 and 471736. Claims 20-23 depend from claim 19 and further define the non-identical nucleic acid molecules. Claim 27 is generically drawn to a collection of non-identical nucleic acid molecules capable of detecting polymorphisms in an Arabidopsis mapping population that are distributed throughout the genome at a particular density, and claims 28 and 29 specify that the set comprise particular polymorphisms.

The specification asserts that these sets of non-identical nucleic acids and computer readable media are useful for the identification of a genomic region associated with a phenotypic trait, positional cloning, and chromosome walking efforts. For the generic sets of polymorphisms, these recited utilities are non-specific utilities, because they are applicable to a broad class of molecules. All sets of nucleic acid molecules from Arabidopsis have some utility in such mapping efforts. The sets of polymorphisms lack specific utility because there is no nexus between the polymorphisms encompassed in the instant claims and any particular utility. The skilled practitioner would recognize that any set of polymorphisms from any organism would generically be useful in analytical assays. However, this type of utility is non-specific. There is no specific utility for the claimed set. There is nothing which links the claimed sets of polymorphisms to any utility which is specific to the polymorphisms. For the sets of particular polymorphisms, this utility is further not substantial because the specification does not disclose a

particular trait or traits that these are associated with, and thus it would require further experimentation to discover what these markers identify, if anything. Thus, the utility is not substantial for the sets of specific markers because it would take further experimentation to reasonably confirm that a specific utility exists for the claimed sets of nucleic acids or for the claimed computer readable media.

Claims 18-29 also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

***Claim Rejections - 35 USC § 112***

13. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

14. Claims 24-29 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 24, 25, and 26 are drawn to computer readable media that have polymorphisms recorded thereon. Claim 24 is drawn to a computer readable medium that has recorded thereon a set of polymorphisms distributed throughout the genome of Arabidopsis, and claims 25 and 26 specify that the set comprise particular polymorphisms.

Claims 27-29 are drawn to collections of non-identical nucleic acids capable of detecting polymorphisms distributed throughout the genome of Arabidopsis. Claim 27 is generically drawn to a collection of non-identical nucleic acid molecules capable of detecting polymorphisms in an Arabidopsis mapping population that are distributed throughout the genome at a particular density, and claims 28 and 29 specify that the set comprise particular polymorphisms.

The specification provides a list of over 56,000 polymorphisms from which to select from for the development of the claimed sets of non-identical nucleic acids or computer readable media (see Table A). This set of polymorphisms represents a listing of polymorphisms between two particular ecotypes of Arabidopsis thaliana, namely the Columbia and Landsberg ecotypes. The claims, however, encompass nucleic acids and computer readable media based on sets of polymorphisms between any A. thaliana ecotypes, for which adequate written description has not been provided.

It is noted that in Fiers v. Sugano (25 USPQ2d, 1601), the Fed. Cir. concluded that

> "...if inventor is unable to envision detailed chemical structure of DNA sequence coding for specific protein, as well as method of obtaining it, then conception is not achieved until reduction to practice has occurred, that is, until after gene has been isolated...conception of any chemical substance, requires definition of that substance other than by its functional utility."

In the instant application, only the polymorphisms between the Columbia and Landsberg ecotypes are described. Also, in Vas-Cath Inc. v. Mahurkar (19 USPQ2d 1111, CAFC 1991), it was concluded that:

> "...applicant must also convey, with reasonable clarity to those skilled in art, that applicant, as of filing date sought, was in possession of invention, with invention being, for purposes of "written description" inquiry, whatever is presently claimed."

In the application at the time of filing, there is no record or description which would demonstrate conception of any sets of polymorphisms between any ecotypes of Arabidopsis other than the ones described in the specification.

***Claim Rejections - 35 USC § 102***

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 18, 24, 25, and 26 are rejected under 35 U.S.C. 102(a) and 102(b) as being anticipated by Cho et al. (Nature Genetics, 23, 203-207 (1999).

Cho et al. teach a computer readable medium which has recorded thereon polymorphisms (See figure 1, description, which states that the polymorphisms they discuss are available on an internet web site). This disclosure meets the limitations of claims 18, 24, 25, and 26, when to have "polymorphisms" recorded on a computer readable medium means that any information at all about a particular polymorphism is recorded on a medium. In this case, polymorphism 471736 is an A→T polymorphism and polymrophism 466799 is a G→T polymorphisms. The disclosure of Cho et al. includes polymorphisms that are both of these transitions, and thus they meet the limitations of the instant claims.

The Cho et al. reference was publicly available September 28, 1999 on the internet (confirmed via communication with the customer service coordinator of the Nature publishing group). Polymorphisms 466799 and 471736 were first disclosed in parent application filed on October 20, 2000. Thus, for claims 18, 25, and 26 which specifically recite these polymorphisms, the priority is granted only to October 20, 2000. Further, claims 18, 24, 25, and 26 are not fully supported by 112 1st paragraph in this or any prior filing (see 112 1st paragraph, Written Description and Enablement rejections contained herein), and thus the priority date for the instant application is considered the instant filing date, and so the application of the Cho et al. reference as a 102(b) reference is proper.

17. Claims 19, 20, 27, 28, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Brennan (US 5474796).

Brennan teaches a collection of non-identical nucleic acids capable of detecting polymorphisms. Specifically, Brennan teaches an array which has every possible 10-mer attached to it (see Example 3). One of these oligonucleotides would be capable of use in a method for each of the polymorphisms recited in the instantly rejected claims. Claims 19 and 27-29 do not contain any structural limitations that define the claimed collection, except that they be "capable of detecting" the polymorphisms. The nucleic acids taught by Brennan comprise at least a subset of non-identical nucleic acids would be capable of doing so by hybridization. Claim 20 requires that the collection be deposited on a substrate and the collection taught by Brennan is deposited on a substrate.

18. Claims 19, 21, 22, 23, 27, 28, and 29 are rejected under 35 U.S.C. 102(a) and 102(b) as being anticipated by Mozo et al. (Nature Genetics, Volume 22, pages 271-275, 1999).

Mozo et al. teach a collection of non-identical nucleic acids that comprises the entire genome of Arabidopsis thaliana. Claims 19 and 27-29 do not contain any structural limitations that define the claimed collection, except that they be "capable of detecting" the polymorphisms. The nucleic acids taught by Mozo et al. comprise at least a subset of non-identical nucleic acids would be capable of doing so by hybridization, or the polymorphisms could be detected within the sequences provided by Mozo et al. by sequencing them. The nucleic acids taught by Mozo et al. have greater than 15 nucleotide bases and would certainly contain the polymorphisms recited within the claims, inherently since the polymorphisms are within the Arabidopsis genome and the nucleic acids taught by Mozo et al. represent the entire Arabidopsis genome. The nucleic acids taught by Mozo et al. would also be useful at least as template in PCR amplification and would, again, comprise polymorphisms.

The Mozo et al. reference is dated July 1999. Polymorphisms 466799 and 471736 were first disclosed in parent application filed on October 20, 2000. Thus, for claims 18, 25, and 26 which specifically recite these polymorphisms, the priority is granted only to October 20, 2000. Further, claims 18, 24, 25, and 26 are not fully supported by 112 1st paragraph in this or any prior filing (see 112 1st paragraph, Written Description and Enablement rejections contained herein), and thus the priority date for the instant application is considered the instant filing date, and so the application of the Mozo et al. reference as a 102(b) reference is proper.

***Claim Rejections - 35 USC § 103***

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

21. Claims 18, 24, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drayna et al. (US 5705343).

Drayna et al. teach a computer readable medium that has nucleic acid sequences which comprise polymorphisms recorded thereon (Col. 6, lines 5-15). The computer readable medium taught by Drayna et al. differs from the instantly claimed computer readable medium only in the content of the data contained therein. Such data is considered non-functional descriptive material because it is not functionally related to the substrate which contains it.

MPEP 2106 (VI) states,

> "Nonfunctional descriptive material cannot render nonobvious an invention that would have otherwise been obvious. Cf. In re Gulack, 703 F.2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983) (when descriptive material is not functionally related to the substrate, the descriptive material will not distinguish the invention from the prior art in terms of patentability). Common situations involving nonfunctional descriptive material are:
> - a computer-readable storage medium that differs from the prior art solely with respect to nonfunctional descriptive material, such as music or a literary work, encoded on the medium..."

Therefore, a computer readable medium as claimed in claims 18, 24, 25, and 26 are prima facie obvious in view of the teachings of Drayna et al.

22. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cho *et al.* (Nature Genetics, 1999, 23:203-207) in view of Lai *et al.* (Genomics, 54:31-38, 1998).

Cho et al. teach a collection of non-identical nucleic acid molecules capable of detecting polymorphisms in an Arabidopsis thaliana mapping population, wherein said collection of non-identical nucleic acid molecules is capable of detecting polymorphisms distributed throughout the genome of Arabidopsis at an average density of one polymorphism per about 244kb. That is, Cho et al. teach a collection of nucleic acids capable of detecting 412 markers throughout the approximately 100Mb Arabidopsis genome.

The set of polymorphisms screened by Cho *et al.* included the polymorphism instantly disclosed as Single Nucleotide Polymorphism 466799 (confirmed by Applicant's remarks in paper number 9 of parent application 09/642412).

Cho *et al.* suggest the generation of denser SNP maps for Arabidopsis (p. 205), but Cho *et al.* do not teach a method wherein the polymorphisms are distributed throughout the genome of Arabidopsis plants at an average density of more than one polymorphism per about 100 kb.

Lai *et al.* teach a high density SNP map of a portion of the human genome, wherein the map has a density of one SNP every 30 kb, and teach that such a map was generated "efficiently and rapidly" using existing methodologies (p. 34).

Thus, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have used the methods taught by Lai *et al.* in order to produce a a

collection of isolated nucleic acids at a higher density than the ones taught by Cho et al. The ordinary practitioner would have been motivated to provide such a method by the suggestion of Cho *et al.* that "The generation of denser biallelic maps should allow high-throughput identification of both monogenic and polygenic traits, effectively removing the rate-limiting nature of high resolution mapping from the study of biological processes (p. 205)." The ordinary practitioner would have been further motivated by the teachings of Lai *et al.* that the generation of SNP-based maps can be accomplished "efficiently and rapidly" using existing methodologies.

***Conclusion***

23. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juliet C. Einsmann whose telephone number is (703) 306-5824. The examiner can normally be reached on Monday through Friday, from 9:00 AM until 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, W. Gary Jones can be reached on (703) 308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 and (703) 305-3014.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Juliet C. Einsmann
Examiner
Art Unit 1634

January 27, 2003

W. Gary Jones
Supervisory Patent Examiner
Technology Center 1600